
1863

VOLUNTEER FORCE CANADA.

**INSTRUCTIONS FOR CLEANING
ARMS.**

INSTRUCTION OF MUSKETRY.

CLEANING ARMS.

Section 1. Names of the different Parts of the Rifle.

Every volunteer must learn the names of the different parts of his rifle.

PLATE VI.

Fig. 1. STOCK.

- A. nose cap.
- B. upper band.
- C. lower band.
- D. swell.
- E. E. projections.
- F. head.
- G. small.
- H. trigger guard.
- K. trigger plate.
- L. trigger.
- M. breech nail.
- N. side nails.
- O. butt. { P. toe.
- { Q. heel.
- R. heel plate.
- S. s. sling.
- T, V. upper and lower swivels.
- W. snap cap.

Fig. 2. BARREL AND RAMROD.

- A. muzzle.
- B. front or foresight.
- C. back or elevating sight. { D. flanges.
- { E. flap.
- { F. slider.
- { G. spring.
- { H. bed.
- K. nipple lump.
- L. nipple.
- M. breech.
- N. breech pin.
- O. breech nail hole.
- T. catch.
- P, P. ramrod.
- Q. head.
- R. point.
- S. shaft.

The side of the rifle on which the lock is placed is called the lock side.

Fig. 3. SWORD AND SCABBARD.

- A. blade. B. hilt. C. guard and ring. D. spring. E. scabbard.



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PLATE VI.

Fig. 1.

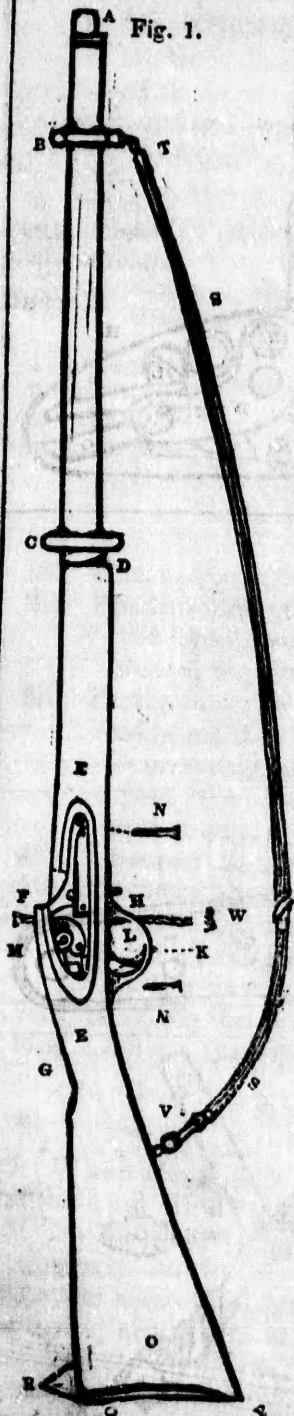


Fig. 2.

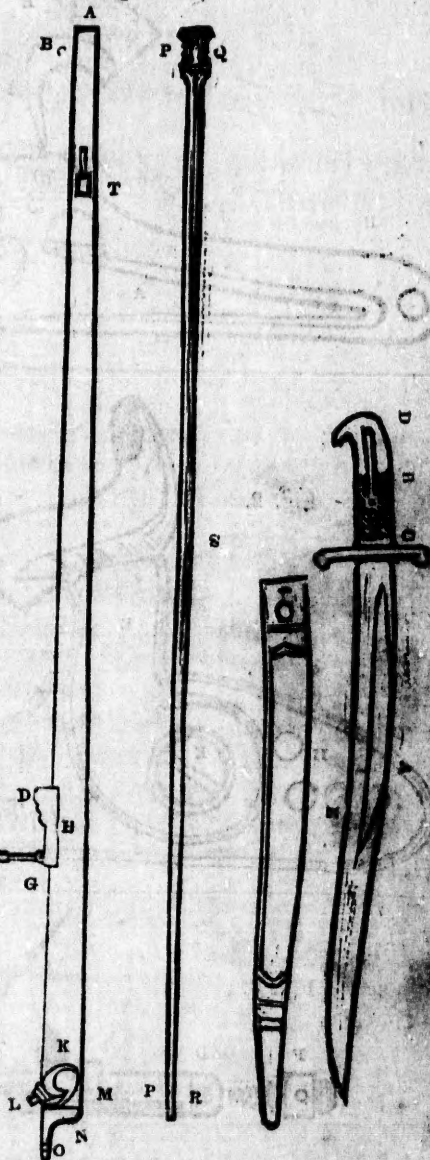


PLATE VII.

Fig. 1.



Fig. 2.

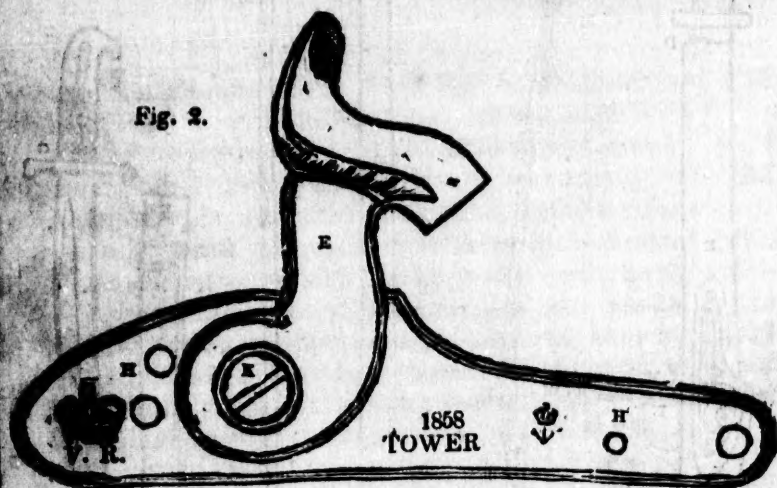
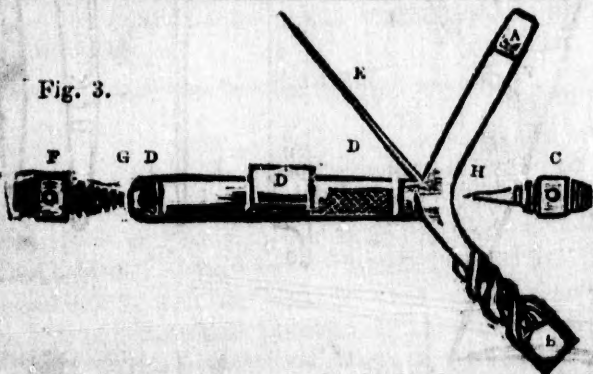


Fig. 3.



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PLATE VII.

Fig. 1 and 2. Lock.

- A. main-spring.
- B. sear-spring.
- C. sear.
- D. bridle.
- E. hammer.
- F. tumbler.

- G. swivel.
- H, H. lock plate.
- K. tumbler nail or pin.
- L. sear-spring nail.
- M. sear nail.
- N. bridle nail.

Fig. 3. NIPPLE WRENCH, &c.

- A. turn-screw.
- B. worm.
- C. drift.
- D, D, D. cramp.

- E. picker.
- F. ball drawer.
- G. nipple wrench.
- H. oil bottle.

S. 2. Dismounting the Lock.

- 1st. Unscrew and remove the tumbler pin.
- 2d. Put the lock at full cock, then place the cramp on the mainspring, and, after letting the hammer down, remove it.
- 3d. Partly unscrew the sear-spring pin, then place the edge of the turn-screw between the bend of the sear-spring and lock-plate, to raise the former from the latter, after which unscrew the sear-spring pin, and remove the sear-spring.
- 4th. Unscrew the sear-pin and remove sear.
- 5th. Unscrew the bridle-pin and remove bridle.
- 6th. Remove the hammer (which is to rest in the hollow of the hand) by a few smart taps,—as near the lock-plate as possible,—with something softer than itself.
- 7th. Remove the tumbler.
- 8th. Remove the swivel from the tumbler.

S. 3. Cleaning the Lock.

1. When the lock is dismounted, wipe the several limbs, first with an oiled rag, and afterwards with a rag quite dry.
2. If any specks of rust are seen, either on the lock (more particularly the tumbler axle hole) or any of the limbs, they are to be removed with an oiled rag. No brick-dust, or powder of any kind, is to be used for this purpose, as such would have the effect of removing the case hardening from those parts that are not steel, and thus render them much more liable to rust.

3. In remounting the lock the threads of the several pins, as also the pivot and axle of tumbler, and pivots of swivel, should be oiled before putting them in their respective places, in order that they may work easily.

4. The other frictional parts of the lock to which it is essential to apply oil (which should be animal and not vegetable) are the nose of the sear, and between the sear and sear spring. Only a very small quantity of oil should be used, and applied either with a feather or the point of the pricker, as too much is likely to clog the parts.

S. 4. Cleaning the Barrel.

Every volunteer should learn the way to clean his rifle.

1. Place the rifle at full cock, and draw the ramrod.

2. Put a piece of rag, woollen if possible, or tow, into the jag, and twist it round so as to cover it.

3. Hold the rifle in the left hand, at the full extent of the arm, barrel downwards, with the forefinger and thumb in line with, and round the muzzle, heel of the butt resting on the ground to the rear.

4. Pour about a quarter of a pint of water into the barrel with care, so as to prevent any of it getting between stock and barrel, or into the lock through the tumbler axle hole ; immediately afterwards put the ramrod into the barrel, and sponge or rub it carefully up and down to remove the dirt or fouling, forcing the water through the nipple to clear the touch-hole. Repeat this process until the barrel is quite clean.

5. Wipe the barrel well out with rag or tow until it is perfectly dry, and afterwards with an oiled rag ; then put the muzzle stopper in the barrel, and the snap cap on the nipple. Care should be taken to keep the snap cap dry when washing out the barrel, and to wipe the mouth of the hammer before letting it down on the snap cap.

6. On the following morning, and on every occasion before using the rifle, wipe the barrel out perfectly clean and dry.

7. The fouling which settles on the stock near the nipple lump when firing should, if possible, be removed without using water or a damp rag. On no account is a knife or sharp instrument of any description to be used to remove the dirt near the nipple lump or trigger plate.

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PLATE VIII.

Fig. 1.



Fig. 2.

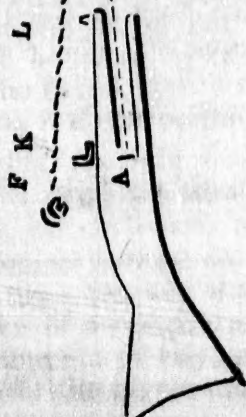
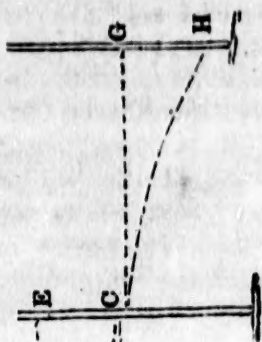


Fig. 3.



8. By the force of the barrel to be the frequent which is always

9. In order and at the same appearance, rub bees-wax between plate and stock or into the lock

1. Attach to
2. Place the
3. Fix the in the lock-plate differs from the flat at the end
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sear-pin.

5. Partly with the thumb the body of the screw home

6. Fix the position as in

7. Attach mainspring, stud in the lock after which cramp; this

Every workman has rules, which The following where must permit, the

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8. By the foregoing mode of cleaning, the liability of the barrel to become rusty will be very much reduced, and the frequent necessity for removing it from the stock, which is always objectionable, be obviated.

9. In order to prevent water soaking into the stock, and at the same time to give it a smooth and polished appearance, rub it over well with oil, and apply a little bees-wax between it and the barrel, and between the lock-plate and stock, to prevent water getting under the barrel or into the lock.

S. 5. Remounting the Lock.

1. Attach the swivel to the tumbler.
2. Place the tumbler in the lock-plate.
3. Fix the bridle on the pivot of the tumbler, and its stud in the lock-plate ; then screw home the bridle-pin, which differs from the other pins (which are rounded off) by being flat at the end.
4. Place the sear between the bridle and the lock-plate, with its nose against the tumbler, and screw home the sear-pin.
5. Partly screw the sear-spring to the lock-plate, then with the thumb of the left hand press the spring against the body of the sear until the stud enters the stud-hole, and screw home the sear-spring pin.
6. Fix the hammer on the squares of the tumbler in a position as if on the nipple, and screw home the tumbler-pin.
7. Attach the swivel by its pivots to the claws of the mainspring, then put on the mainspring, by placing the stud in the lock-plate, and its catch against the fore-stud ; after which place the lock at full-cock to remove the cramp ; this being done, ease the lock to half-cock.

THEORETICAL PRINCIPLES.

Every volunteer should understand the reasons for the rules, which are laid down for his guidance in practice. The following explanations will be found sufficient, though, where musketry instructors are employed, and time will permit, they may be given more at length.

1. The axis of the piece is an imaginary line along the centre of the barrel A, B, fig. 1, Plate VIII.

2. The "line of fire" (B, C) is the continuation of the axis, and the direction in which the bullet would fly, with uniform velocity, were it not impeded by the resistance of the atmosphere and drawn down by the force of gravity.

3. The air is an elastic fluid that resists the bullet and reduces its velocity; the greater the velocity with which the bullet proceeds, the greater is the resistance it meets.

The "force of gravity" draws the bullet downwards from the moment it quits the muzzle, and acts with increased power the longer the bullet is exposed to its influence. These two powers combined, the one increasing as the other diminishes, cause the bullet to fly in a curved line, called the trajectory, B, D, fig. 1, Plate VIII.

According to the above principles, if the axis of the rifle were directed to an object C, fig. 1, Plate VIII., in a target, when fired, the bullet could not hit that mark, as the air and force of gravity would oblige it to fly along the trajectory to the point D, which would actually in the first 100 yards, be 1 foot 5 inches lower down; therefore, in order to hit the point C, it is necessary to elevate the muzzle till the axis of the barrel is directed to a point E, 1 foot 5 inches above it. To enable this to be done, the sights K, L, fig. 2, are so arranged as to place the rifle, when they are both accurately brought up to the line of sight, which is the line F, C, between the eye and the point aimed at, exactly in the required position.

If, however, the target were removed to a greater distance, and the rifle were fired from the same position, the bullet would follow the trajectory, and strike a point H below the point G aimed at; it is necessary, therefore, to increase the elevation of the muzzle as the distance increases, for which purpose the back sight is furnished with a flap and slider marked with the distances up to 1100 yards for which the elevations are required.

The thickness of the barrel at the breech is greater than its thickness at the muzzle, which in itself gives elevation; combined with this the lowest sight is arranged to give the proper elevation for 100 yards; when firing at a shorter distance it is therefore necessary to fire a little under the mark, at 50 yards about 8 inches, at 30 yards about 4 inches.

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The volunteer must be very careful that he holds the sight of his rifle quite upright when taking aim; if it inclines to either side, instead of hitting the mark aimed at, the ball will invariably strike on that side to which the sight is inclined. See fig. 3, Plate VIII.

Allowance must be made for the wind when firing, but the extent of the allowance can only be learned by experience.

If in loading the volunteer observes that there is not sufficient powder in the cartridge, or should he accidentally spill any, he must in firing aim a little high, otherwise the bullet will fall short of the mark.

AIMING DRILL.

1. A musketry instructor or an experienced shot must superintend each squad, at this and the following drills; the squad should not exceed ten men.

2. In this exercise the volunteer is to be instructed how to aim and to adjust the back-sight of his rifle, and his progress is to be tested by making him aim at the different distances by means of a rest. If traversing rests are not available, a tripod formed of three stakes tied or looped near the top, supporting a bag of sand about 4½ feet from the ground, will answer the purpose.

3. The instructor is first to explain the principles of aligning the sights of the rifle on an object, confining the attention of the volunteer to the following simple rules:—

1st. That the sights should not incline to the right or left.

2nd. That the line of sight should be taken along the centre of the notch of the back-sight and the top of the fore-sight, which should cover the middle of the mark aimed at.

3rd. That the eye should be fixed steadfastly on the mark aimed at, and not on the barrel or fore-sight; the sights will then be brought up to the line of sight.

4th. That in aiming the left eye should be closed. If a man is not able to do this at the outset, he will soon succeed by tying a handkerchief over the left eye.

4. The instructor will also explain the difference between fine, full, and half sight in aiming, as follows, viz :

1st. Fine-sight is when the line of sight is taken along the bottom of the notch of the back-sight, the fine point of the fore-sight being only seen in the alignment ; as A, fig. 1.

Fig. 1.



2nd. Full-sight is when the point of the fore-sight is taken in alignment with the shoulder of the notch of the back-sight ; as B, fig. 2.

Fig. 2.



3rd. Half-sight is when the point of the fore-sight is aligned midway between the shoulder and bottom of the back-sight ; as C, fig. 3.

Fig. 3.



5. Aiming with the half-sight is the usual method ; aiming with a fine-sight will give a little less elevation ; and aiming with a full-sight a little more.

6. The instructor will next cause each man to place his rifle in the rest and align it with the sight for 100 yards on a mark that distance from him ; having done so, he will leave his rifle on the rest and step aside. The instructor will then see if the aim is correct, and should he discover any error, he will point it out and cause it to be corrected, or call upon another volunteer to correct it.

7. The foregoing proceeding is to be carried out, at every distance of 50 yards, from 100 to 900 yards, at "bull's-eyes" of the following dimensions, viz :—

From 100 to 300 yards, eight inches in diameter.

From 350 to 900 yards, two feet.

POSITION DRILL.

In this drill the volunteers will be put through the following practices in squads of about ten men each, formed in single rank, at one pace apart, great care being taken that all their positions and movements are correct. When coming to the "present," they should be taught to aim at small "bull's-eyes," painted as described in the Platoon Exercise, page 29.

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First Practice.

In the first practice after the caution, **POSITION DRILL, FIRST PRACTICE AS A FRONT (OR REAR) RANK, STANDING (OR KNEELING)**, the word **AT—YARDS-READY** will be given, on which the volunteer will proceed as described in the Platoon Exercise. On the word **PRESENT**, without moving the body, head, or eye, the volunteer will throw the rifle smartly to the front of the right shoulder to the full extent of the left arm (the arms moving close in to the body); he will raise the rifle in so doing, keeping the sight upright; the top part of the heel plate to be in a line with the top of the shoulder, the muzzle to be a few inches below the mark the eyes are fixed upon, the forefinger to be extended along the outside of the trigger guard, and both elbows to be inclined downwards. On the word **two**, he will bring the rifle smartly to the hollow of the right shoulder, as described in the Platoon Exercise, the forefinger remaining extended outside the trigger guard. On the word **THREE**, he will bring the rifle down to the capping position without altering the position of the body, head, or eye; in this manner the motions of the "Present" must be repeated several times, after which, on the word **EASE SPRINGS**, the volunteer will let the hammer down on the nipple, and will be directed to **ORDER ARMS AND STAND AT EASE**.

After this, the volunteer will go through the practice, judging his own time, on the words **AT—YARDS READY, FIRST PRACTICE JUDGING YOUR OWN TIME—PRESENT**. When he has repeated the motions several times, without further word of command, on the word **STEADY** he will cease the practice, remaining at the capping position till directed to **EASE SPRINGS—ORDER—ARMS AND STAND AT EASE**.

Second Practice.

In the second practice, the volunteer will go through all the motions of the "Ready" and "Present" by motions, including the pulling of the trigger as explained in the Platoon Exercise, except that in the fifth motion of the "Present," he will bring his rifle down to the capping position, and full cock, after which the movements of the "Present" will be repeated several times.

Third Practice.

In the third practice the volunteer will learn to load, standing, and judging his own time; he will then practise independent file firing both standing and kneeling.

SNAPPING CAPS AND BLANK FIRING.

Volunteers who have not been accustomed to firing should first be practised in snapping caps while taking aim, until the tendency to wink at the explosion is overcome, after which they should be practised in firing blank cartridge to accustom them to the recoil of the rifle. About 10 caps fired at different drills should suffice for the former practice, with 10 rounds of blank cartridge for the latter; 5 caps or rounds to be fired singly, 2 by file, and 3 in volleys.

JUDGING DISTANCE DRILL.

As proper elevation is of such great importance in firing, the volunteer should be well practised in judging distances; for this purpose men should be placed in front of the squad, at measured distances of 50 yards apart, from 50 to 300 yards for the first practice, and afterwards from 300 to 900 yards. The attention of each volunteer should be directed to the appearance of these men, and of their features, accoutrements, &c., at the different distances; they must remember the distances at which the smaller objects become indistinct or invisible. Each volunteer should be called upon to explain to the instructor what he sees; the explanation should be in a low tone of voice, in order that the rest of the squad may not hear.

It must be explained to the volunteer that the sun, the state of the atmosphere, and the background will make a difference in the appearance of the same objects at different times.

After the above exercises, volunteers should be practised in judging unknown distances; the accuracy of their judgment will be tested, by measuring the distances with a chain or cord.

PRACTICE.

Section 1. Target Practice.

1. The volunteer having been thoroughly practised in the foregoing exercises, he will go through a course of target practice.

2. The targets are to be six feet in height and two in breadth, constructed of iron of sufficient thickness to be rifle bullet proof; they should be coloured white with a mixture of whiting and size; the bull's-eye and circle describing the "centre," black, with lamp-black, water, and size.

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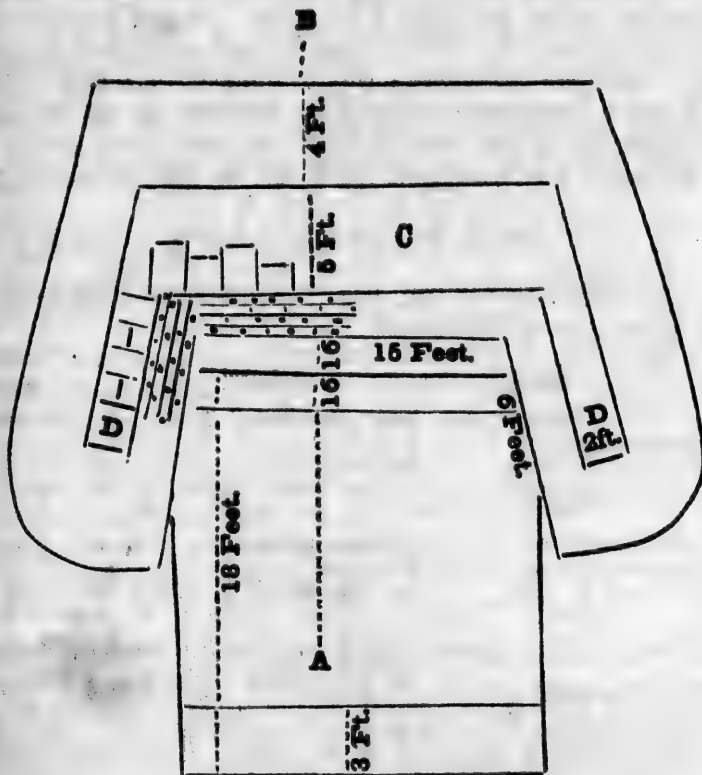
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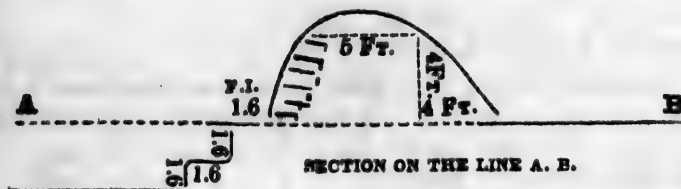
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PLATE IX.

MARKERS BUTT.



This is the smallest description of Butt that ought ever to be made, and the markers must always sit on the upper banquette close to the interior slope, which is to be revetted with turf.



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3. Great care must be taken in lowering or raising the targets to prevent them being damaged.

4. In all cases where the nature of the ground admits of it, a trench is to be dug for the "markers," of the dimensions given in Plate IX., about fifteen yards to the front, and to one side of the targets, and in such a position that the markers may easily see the face of the target from it; the earth excavated should be thrown up on the side of the firing c; there should also be two epaulments, D, D, so as to screen the men not only from the shots themselves, but from any stones that may be thrown up by them.

5. The shots that strike the target are to be denoted by flags* of different colours raised above the butt. These flags, together with the number of points fixed as the value of the shots, are as follows:—

	Shots.	Flags.	Value in points.
In the practices to 300 yards inclusive.	Outer	- White or yellow	- - - - 1
	Centre	- Dark blue	- - - - 2
	Bull's-eye	- Red and white	- - - - 3
	Ricochet	- Red flag waved in front of the butt	R
	Miss	- - - - -	0
In the practices at distances beyond 300 yards.	Outer	- White or yellow	- - - - 1
	Centre	- Dark blue	- - - - 2
	Ricochet	- Red flag waved in front of the butt	R
	Miss	- - - - -	0

6. Ricochets, or shots which strike the ground before hitting the target, are to be signalled by waving the red flag twice to and fro in front of the target, and are to be counted as misses in individual firing, but noted in the register by the letter R.

7. The signal for "danger," or "cease firing," is in all cases to be a red flag, which will be hoisted and planted on the top of the butt, whenever it is necessary to cease firing to recolour the targets, or for any other purpose.

8. Whenever a shot strikes to the right, the flag denoting

* The number of flags required is as follows, viz:—

- 1 Large red flag, 6 feet square, to be planted in a conspicuous place in the neighbourhood of the range before the firing commences, and to remain till it is over, to warn persons off the ground.
- 4 { 2 red do. 2½ " } for the use of look-out men.
 { 2 do. do. } one for use at the firing point.
 { 2 do. do. }
 1 red and white do. do. } for use in the marker's butt.
 1 dark blue do. do. }
 1 white do. do. }

The large flag may be obtained for 3s., and the smaller ones for 1s. 8d.; lance poles 10 feet long should not cost more than 2s. 4d.

its value is to be inclined to the right, and *vice versa*. When the shot strikes high, the flag is to be raised as high as possible and when low, it is only to be raised high enough to be easily visible above the butt.

9. The section or squad is always to load by word of command. When every thing is ready to commence, a signal will be made to the markers, and as soon as the danger flag is lowered, the officer is to order the practice to go on. The right hand man of the front rank will then take a pace to his front, come to the capping position, and fire; after which he will come to the shoulder from the capping position, and form three paces to the rear of the point he previously occupied; the next man of the front rank will then move to the front and fire.

10. Whenever the hits on the target become too numerous to distinguish quite easily the new ones as they strike, the target is to be coloured afresh.

11. Every volunteer is to expend in his course of practice 90 rounds of ball ammunition, in the following manner, viz:—

60 in individual firing,
10 by files,
10 in volleys, and
10 in skirmishing order.

12. The number of rounds to be expended at each distance, the distances and number of targets to be fired at by the several classes in individual firing, and the size of the bull's-eye, and centre for each class, are as follows:—

	Yards.	Rounds.		
3rd class.	150 -	- 5	Two targets placed together.	Having a bull's eye eight inches in diameter, and a black circle two feet in diameter.
	200 -	- 5		
	250 -	- 5		
	300 -	- 5		
2nd class.	400 -	- 5	Four targets placed together.	Having a black centre two feet in diameter and no circle.
	500 -	- 5		
	550 -	- 5		
	600 -	- 5		
1st class.	650 -	- 5	Six targets placed together.	Having a black centre three feet in diameter and no circle.
	700 -	- 5		
	800 -	- 5		
	900 -	- 5		

13. Volunteers should never fire more than 10 rounds at any one practice.

S. 2. *File Firing and Volley Firing.*

The volunteer will fire 10 rounds in the order of file firing, and 10 in volleys, as detailed in the platoon exercise. The mark for these practices will be eight targets placed close together side by side, each having a separate bull's-eye and centre, of the dimensions detailed for the third class; the distance to be 300 yards for file firing, and 400 yards for volley firing, if the range will admit.

S. 3. *Skirmishing.*

Volunteers will fire 10 rounds in skirmishing order, both advancing and retiring between 200 and 400 yards. The marks for this practice to be eight targets placed in a row, each having a bull's-eye and circle, as for the third class, with intervals of six paces between them; each file to have a separate target.

REGISTERS OF FIRING.

The following registers will be kept by rifle corps. The forms may be obtained by application to the Secretary of State for War.

1. "*Target Practice Register*," War Office Form 1601, in which the volunteers' names must be entered previously to going out to practise.
2. "*Musketry Drill and Practice Return*," War Office Form 1600, which should be kept as a permanent register, in a book.
3. "*Table of performances in platoon and skirmishing practices*," War Office Form 1603, and on the back of Form 1600.
4. "*Recapitulation*," showing the figure of merit, to enable different corps to compare with each other, on back of Form 1600.
5. When trained instructors are employed, a *Judging Distance Register*, War Office Form 1602, may also be kept.
6. "*Diagram*" recording the result of Practices.

MARKING POINTS AND CLASSIFICATION.

The individual firing will be divided into three periods, 20 rounds to be fired in each.

In the first period each volunteer will fire five rounds at every distance of 50 yards, from 150 to 300 yards inclusive; the points gained will be marked in the "Target Practice Register," Form 1601, and the total points obtained at each distance, will be transferred to "Musketry Drill and Practice Return," Form 1600.

When the corps has completed the first period, the points obtained individually at the several distances, are to be added together, and the sum entered in the column "total points" of the period, in the "Musketry Drill and Practice Return," Form 1600, to show the value of the performances of each volunteer, from which column a classification is to be made;—all those who have obtained 15 points and upwards, will fire the second period in the second class, and those who have not obtained this number, will fire their second period at the same distances as the first, that is, in the third class.

At the conclusion of the practices in the second period, the points obtained by each man at the several distances are to be added together, and the sum entered in the columns "total points," from which a second classification is to be made for the firing in the third period; all men of the second class who have obtained 12 points and upwards, are to pass into the first class; and all men of the third class, who have obtained 15 points and upwards, into the second class. Those men who have not obtained the number of points specified, will remain in the second and third classes respectively.

At the conclusion of the practices in the third period, the points obtained by each man are to be added together, and the sum entered in the columns "total points," from which a final classification is to be made, and entered in the columns for that purpose.

In file firing the bullets striking the target will have the same value, in points, as in the third class, and will be marked collectively in the Form 1603.

In volley firing the hits are to be counted as in the second class, bull's-eyes being reckoned only as centres.

In skirmishing the hits are to be counted as in volley firing; bull's-eyes being only valued as centres.

The average points obtained in the "skirmishing practice," and in the practices of "file and volley firing," added to the average obtained in the first period, will give the "figure of merit" of the shooting of the corps.

The dates on which the preliminary drills are performed will be entered in the "Musketry Drill and Practice Return."